



## UNIT 2 - FUELS

### SECTION 2 - FUELS FOR EVERYTHING



## CONCEPT MAPPING FUELS

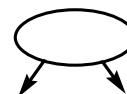
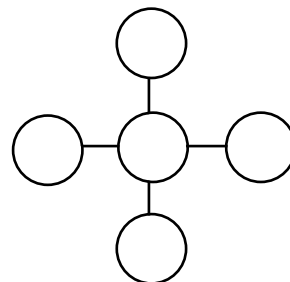
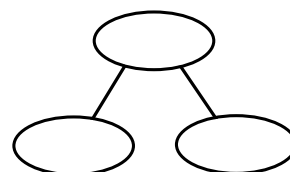
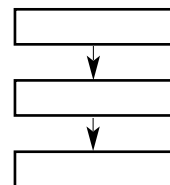
### Background

A concept map is a way of representing relations between ideas, images or words, in the same way that a sentence diagram represents the grammar of a sentence, a road map represents the locations of highways and towns, and a circuit diagram represents the workings of an electrical appliance.

In a concept map, each word or phrase is connected to another and linked back to the original idea, word or phrase. Concept maps are a way to develop logical thinking and study skills, by revealing connections and helping students see how individual ideas form a larger whole.

Concept maps are flexible. They can be made simple or detailed, linear, branched, radiating, or cross-linked.

- Linear concept maps are like flow charts that show how one concept or event leads to another.
- Hierarchical concept maps represent information in a descending order of importance. The key concept is on top, and subordinate concepts fall below.
- Spider concept maps have a central or unifying theme in the center of the map. Outwardly radiating sub-themes surround the main theme. Spider concept maps are useful for brainstorming or at other times when relationships between the themes need to be left open-ended.
- Cross-linked maps use a descriptive word or phrase and identify the relationship with a labeled arrow.



**CONCEPT MAPPING FUELS  
INVESTIGATION CONT.**

*Fuels for Everything* introduces non-transportation and conventional transportation fuels. Non-transportation fuels include biogas, biomass, coal and syngas. Conventional transportation fuels include diesel, gasoline and kerosene.

In this activity groups of students will create miniature concept maps on non-transportation fuels and conventional transportation fuels using one or more of the fuels listed above. Each group will then fit its concept-map pieces onto a poster board to create one large concept map.

**Problem** (fill in problem): \_\_\_\_\_

\_\_\_\_\_

**Materials**

1 big piece of poster board  
copies of *Fuels for Everything*

markers  
1 piece of paper per group

**Procedure**

1. The first step in creating a concept map is to decide on a main topic or idea, print it in the middle of the page, and draw a shape around the words. The main topic in this lesson is fuels. Notice that your teacher has a piece of poster board on display with the main topic.
2. There are two subtopics of this main topic: non-transportation fuels and conventional transportation fuels. Your teacher has also printed these two subtopics on the poster board.
3. Your teacher will assign your group one or more types of fuels.
4. Write the name of your fuel in the middle of your paper and draw a shape around it.
5. The next step in creating a concept map is to determine the major concepts. Major concepts for each fuel are: where the fuel comes from, what products come from the fuel, and what the fuel is used for.
6. Using a cross-linked technique, draw a short line down from the shape that contains the type of fuel you have been assigned. Write the first concept (where the fuel comes from) at the bottom of the line. Draw another short line going down.
7. Read about your group's assigned fuel in the section titled *Fuels for Everything*. Record a word or a short phrase about "where the fuel comes from" at the bottom of your line.
8. Draw a shape around the word or phrase. Draw another short line going down.
9. Follow this same procedure for each concept. Be aware that all concepts are not necessarily covered for each fuel.

**CONCEPT MAPPING FUELS  
INVESTIGATION CONT.**

- 10 Look back over *Fuels for Everything* and determine which subtopic your fuel belongs in.
11. Request permission and record your mini-concept map(s) on the poster board under the subtopic.
- 12 Make your own copy of the completed concept map. You will be using this concept map as a model for the next section, entitled *What Are Alternative Fuels?*

**Observations**

1. What are the benefits of concept mapping? \_\_\_\_\_  
\_\_\_\_\_

2. What are the drawbacks to concept mapping? \_\_\_\_\_  
\_\_\_\_\_

**Application**

1. The background section of this lesson described four ways to make a concept map: spider, hierarchical, linear and cross-linked. Concept maps can also include pictures instead of words or phrases. Pick one different type of mapping, and one subtopic, either non-transportation fuel or conventional transportation fuel, and create a new concept map.

**Going further**

1. Using the same or a different technique for concept mapping that you chose in the application section, map the second subtopic for fuel.